

## Appendix D

### National Weather Service Telecommunications Gateway (NWSTG) Message Format

The NWSTG will receive binary data at the National Weather Service Telecommunications Gateway (NWSTG) through a dedicated point-to-point circuit from the DAPSII at Wallops. The general characteristics of this circuit are as follows:

Channel type	Full duplex synchronous
Channel speed	9600 bps
Code	Binary/ASCII
Parity	None
Error control	Frame checksum (CCITT 16-bit)
Link control	LAPB (Link Access Procedure B)
Packet	X.25 (Permanent Virtual Circuit)
Frame size	263 bytes (maximum)

Higher speed circuits will be installed as required to meet increasing data rate requirements.

The standard X.25 (layers 1 through 3) is implemented for both transmission from DAPS and reception at NWSTG. The X.25 circuit is Permanent Virtual Circuit (PVC) in operation, and the channel and group numbers are all set to zero (dedicated links).

The product transmission will begin with a SOH (Start of Header) character and end with an ETX (End of Text) character. All intervening frames (blocks) will not carry any control characters, as the layers 2 and 3 of the standard X.25 will take care of that requirement. The function of the Transport Layer (layer 4) is provided in a layer 3 "more data bit" flag, because the line between NMC and DAPS is a dedicated circuit on which all data is sent sequentially, frame-to-frame, from beginning of product to end of product.

The CCITT X.25 communication standard is described in detail in the CCITT documentation on X.25 and is also provided under Federal Standard 1041 and FIPS Publication 100 of the Department of Commerce. The occurrence of various link level and packet level bytes on the circuit follows the X.25 standard format.

The entire X.25 frame structure is illustrated as follows:

where PAD = flag byte of 01111110 (in binary)

ADR = frame address

CMD = command byte

FCS = frame checksum

Flag PAD bytes of 01111110 (in binary) are placed at the beginning and the end of the physical structure of a frame. The frame is 263 bytes in length for all but the last frame of the message, which may be any length up to 263 bytes. The CCITT 16 bit frame checksum (FCS) is based on the following polynomial:

$$X^{16} + X^{12} + X^5 + 1$$

The envelope is a part of the packet text as shown above and defines the content of the message. The envelope will surround the product or message (message text) being sent. The graphical representation of an envelope is shown as follows.

S	WMO/X.25	Abbreviated	Bulletin	C	C	L	E
O	Beginning	Heading	Text	R	R	F	T
H	Format						X

### Envelope

where CR = carriage return control character

LF = line feed control character

ETX = end of text character

Bulletin text = DCS message or portion thereof

"WMO beginning format" and "Abbreviated Heading" require further explanation:

The WMO Alphabet 5 beginning format will be structured as:

S	C	C	L	nnn	S	CLLLL
O	R	R	F		P	
H						

where SOH = start of header character  
 nnn = message sequence number  
 SP = space character  
 CLLLL = catalogue number. (Set ASCII to 55555)

The general form of the Abbreviated Heading is as follows:

C	C	C	T <sub>1</sub> T <sub>2</sub> A <sub>1</sub> A <sub>2</sub> ii	S	CCC	S	YYGGgg
R	R	R		P	C	P	

where T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii = data description, a product identifier assigned by the NWS  
 CCCC = international four-letter designation for the DCS/DAPS (assigned by the NWS)  
 YYGGgg = data time group

The products will be transmitted when available. Each product will be broken up into many frames for transmission over this link if needed. The circuit will be filled with the PAD bytes of 01111110 (in binary) continuously between products with a minimum of one between frames of the product transmitted. There will be one or more PADS between products.